CORRESPONDENCE.

THE LEIPZIEGER KRANKENCASSE.

To the Editor of the Assurance Magazine.

SIR,—I hope it will be of some interest to you, and to the readers of the *Magazine*, if I give you some account of a Company, proving the brilliant success of the adoption of scientific principles in carrying out assurance business. It was in 1855, when Dr. Heym, in Leipzig—a mathematician who has well studied life contingencies under all their different points of view—formed the idea of promoting a Society for the purpose of insuring a weekly sick allowance to its members. Naturally enough for him, he meant to establish a Society on sound, rational, and scientific principles; but, to the public, his ideas appeared to emanate from quite a new point of view, and where dared he hope to find belief in the correctness of his statements and calculations? Up to that time, and still, there is in Germany a vast number of Societies which promise to provide for their members in case of sickness, but they are all on the principles of your old Friendly Societies—they admit members of all ages at a uniform rate of premium; and, in general, this premium would not even be sufficient for young ages. It is no wonder that these Societies are constantly breaking up, just as it has been in England; and we often see that those members who have paid premiums for many years find themselves without the support of the Society, which has become insolvent when they looked forward for its assistance. Dr. Heym began his work by publishing a paper about the organization of Friendly Societies (*Die Einrichtung der Krankencasse*), with special reference to Leipzig. It was the principal object of Dr. Heym to show in this paper the deficiencies of the old system, and to demonstrate in a clear and popular way how a Friendly Society ought to be organized, what premiums should be taken, and what part of them should be regularly reserved in order to render it safe. Dr. Heym found it not easy to fix the data upon which the premiums might be computed. Statistics with reference to sickness had been less cultivated in Germany than you might expect; and Dr. H. himself had to collect data from the books of some Friendly Societies in Leipzig. By these means he found that the duration of sickness, at the average age of 45 years, has been in Leipzig 1·2784 weeks per annum, while it is in England (according to Finlaison's report) 1·4724 weeks; and, reduced in this proportion, 0·86888 : 1, he makes use of the English data to fix the mean duration of sickness for Leipzig.

It had been a general rule, in the old Friendly Societies in Germany, to pay the whole sick allowance only for the duration of six months, then to reduce it to one-half for another six months; then, if the sickness continued longer than a year, to reduce it still more, and by no means to grant any sick allowance for longer than one year and a half for the same sickness. It seemed advisable not to give up this system; but, nevertheless, to allow the members to insure such diminishing sick allowance at reduced premiums. Dr. Heym found, by examining the books of the Friendly Societies then existing at Leipzig, that he could reduce the premiums for such a diminishing sick allowance by multiplying them by 0·73391.

Table of Premiums, calculated by Dr. Heym, for a Daily Sick Allowance of Unity, payable during the whole duration of Sickness—interest 3 per cent.

Age.	Annual Premium.	Single Premium.	Age.	Annual Premium.	Single Premium.
20	10·807	240·40	70	54·770	352·87
30	12·852	256·50	80	89·964	366·73
40	16·163	277·42	90	128·398	494·97
50	21·898	300·23	95	145·291	145·29
60	32·951	326·43			

This paper had a very great effect; it was approved of in all parts of Leipzig; and already, in 1855, a mutual Society, granting to its members a weekly allowance in case of sickness, has been established on rational principles. Its leading features, as contained in its deeds, are:—Insurance taken for the whole term of life, or for a short period—from 1 to 5 years. Members are admitted from 15 to 50 years of age; when older than 50 years, only under special conditions. A weekly sick allowance can be insured of from 1 thaler (3s. sterling) to 5 thalers (15s. sterling); the premiums to be calculated on the best data at 3 per cent. interest, and to be charged with 10 per cent. for expenses of management and bonus. A balance to be made up every year, and an extra premium to be charged if the account should show that the liabilities exceed the assets; in case of a considerable surplus, it is to be divided, but not until the Society has become so large that no considerable deviation from the average sickness is to be feared. Two different methods of insurance are introduced — A, the entire weekly sick allowance payable for the duration of the sickness, but not exceeding 18 months: B (1), entire allowance payable for 6 months, one-half of it for the next 6 months, and one-fifth for the then succeeding half year; (2), one-half of the allowance payable, if the sickness does not entirely prevent the member from working for the duration of 1 year, and one-fifth for the then succeeding 6 months; (3), one-half of the allowance payable if the patient is convalescent, and in the third semestre only one-fifth. For one and the same sickness, no allowance granted longer than 18 months continually. If the sickness last longer, a medical investigation is to decide whether the patient is to be considered curable, or not; if curable, he has no claim for sick allowance until he has been completely cured, and no other sickness occurs before the lapse of the year afterwards; if incurable, and he has not been a member for 20 years, the board of directors shall decide whether any further claim shall be allowed; but if he has been a member for 20 years, he is to receive annually, for the remainder of his life, such sum as his sick allowance would have amounted to in the year when he became an invalid, according to the tables of average amount of sickness. All disputes and questions between a member and the Society finally to be settled by arbitration.

From the annual reports and balance sheets of the Society I extract the following data:—

End of	Number of Persons insured.		WEEKLY SICK ALLOWANCE.		Persons falling Sick.		Days of Sickness.		Mortality.	
			Whole Term of Sickness.	Diminishing Rate.						
	Males.	Females.	Thalers.	Thalers.	Males.	Females.	Males.	Females.	Males.	Femls.
1855	321	176	330⅛	539⅔	20	8	338	132	..	..
1856	867	568	691½	1,957⅕	165	79	3,570	1,713	5	1
1857	1,386	1,064	1,040⅔	3,768⅛	361	240	7,621	5,501	15	6
1858	1,650	1,326	1,212⅛	4,490	472	335	8,500	6,420	11	14

	Premiums, &c.			Interest.			Sundries.			Total Receipts.		
	Th.	gr.	pf.	Th.	gr.	pf.	Th.	gr.	pf.	Th.	gr.	pf.
1855	661	4	0	1	24	0	33	23	5	696	21	5
1856	3,098	16	8	33	23	5	5	21	0	3,138	1	3
1857	6,098	4	1	96	15	5	92	9	5	6,286	29	1
1858	8,296	17	8	203	10	3	6	10	8	8,506	8	9

	Sick Allowance paid.			Salaries, &c., Expenses of Management, Commission.			Total Expenditure.			Surplus.		
	Th.	gr.	pf.	Th.	gr.	pf.	Th.	gr.	pf.	Th.	gr.	pf.
1855	108	16	4	153	20	9	262	17	3	434	14	2
1856	1,251	10	3	525	4	8	1,776	15	1	1,361	16	2
1857	3,138	18	0	959	3	6	4,097	21	6	2,189	7	5
1858	4,176	26	6	1,152	7	1	5,329	3	7	3,177	5	2
Accumulated Funds..............										7,162	13	1

Assets.

	Present Value of Premiums.			Cash and Debtors.			Total.		
	Th.	gr.	pf.	Th.	gr.	pf.	Th.	gr.	pf.
1855	23,283	9	6	448	9	6	23,731	19	6
1856	68,372	3	0	1,796	0	4	70,168	3	4
1857	116,213	7	2	4,054	18	9	120,258	26	1
1858	142,655	16	5	7,189	1	1	149,844	17	6

Liabilities.

	Present Value of Sick Allowance.			Creditors.			Total.			Surplus Fund.		
	Th.	gr.	pf.	Th.	gr.	pf.	Th.	gr.	pf.	Th.	gr.	pf.
1855	23,560	26	4	13	25	4	23,574	21	8	156	27	4
1856	69,610	15	9	..			69,610	15	9	557	17	5
1857	119,345	9	6	60	11	0	119,405	20	6	853	5	5
1858	148,263	5	7	26	18	0	148,289	23	7	1,554	23	9

I consider these figures very instructive, and they scarcely want any further explanation. They clearly show how quickly a well-organized Friendly Society is gaining the confidence of the public, although it be the first institution of this kind which has broken through the customary organization of former times; and, at the same time, they prove the high degree of security existing in the *scientific* foundation of an Insurance Office.

After such results, we cannot be astonished in learning that the conductors of this Society wished to extend its operations beyond the narrow sphere of the town of Leipzig (with 80,000 inhabitants) and its vicinity, to which its activity had been limited. It is again Dr. Heym, whom we may consider as the soul of the institution, who works out the new plan of the Society to be adopted, embracing life assurance and annuities in case of ill health, while continuing the insurance of sick allowance, and with the intention to extend its activity to Saxony first, and then to Germany in general.

But, before I report this new plan, I must not forget to mention another paper of Dr. Heym, published lately under the title—*Observations on the Books of the Leipzig Krankencasse.*

After a recapitulation of the data upon which the premiums have been calculated, and a statement of the way in which the data have been obtained, we find some tables of annuities, life assurances (single and annual premiums), and single and annual premiums for sick allowance, at 3, 3½, 4, 5, and 6 per cent. interest. From these tables I quote—

Annual Premiums for providing for a Weekly Allowance of Unity in case of Sickness. Net premiums charged with 10 per cent.

AGE.	FOR THE ENTIRE DURATION OF SICKNESS.					DIMINISHING ALLOWANCE.				
	3 per Cent.	3½ per Cent.	4 per Cent.	5 per Cent.	6 per Cent.	3 per Cent.	3½ per Cent.	4 per Cent.	5 per Cent.	6 per Cent.
20	1·48	1·44	1·36	1·28	1·24	1·08	1·04	1·00	0·96	0·92
25	1·60	1·56	1·48	1·40	1·32	1·16	1·12	1·08	1·04	0·96
30	1·76	1·68	1·64	1·56	1·48	1·28	1·24	1·20	1·12	1·08
35	1·96	1·88	1·84	1·72	1·64	1·44	1·40	1·36	1·28	1·20
40	2·20	2·16	2·08	1·96	1·88	1·64	1·56	1·52	1·44	1·36
45	2·56	2·48	2·40	2·28	2·20	1·88	1·80	1·76	1·68	1·60
50	3·00	2·92	2·84	2·72	2·64	2·20	2·16	2·08	2·00	1·92

During the existence of the Society, the form of proposals has been changed very often. Medical examination has greatly increased. In 1858, 20 out of 540 proposers had to undergo a medical examination; and, in 1853, 331 out of 999 proposers. The physicians had generously renounced every fee for the examinations, nearly 1,000 in number.

Special care has been taken to avoid frauds; and it has been made a general rule never to insure a weekly sick allowance exceeding the weekly earnings of the member.

The premiums are paid monthly, they are collected from the members; this system causes a considerable part of the expenses, but it seems unavoidable. It is of interest to notice the influence of the days of the week in the beginning of sickness.

	Males.	Females.	In general.
	Per Cent.	Per Cent.	Per Cent.
Sunday	8·10	8·90	8·41
Monday	20·46	19·90	20·24
Tuesday	19·10	17·80	18·60
Wednesday	17·86	13·92	17·84
Thursday	12·98	17·80	13·35
Friday	10·49	9·38	10·06
Saturday	11·01	12·30	11·50
	100·	100·	100·

According to Dr. Heym, these results are easily accounted for; there exists such a powerful inclination towards amusements (which in Germany, you know, principally take place on Sunday), that a slight uneasiness is over-looked, and not notified to the Society till Monday; on the other hand, the Sunday pleasures, which often are sought for when the body is already unhealthy and ought to repose, are enemies to health, and cause a great deal of slight, and often serious, uneasiness. Thus, the number of persons falling sick increases in the beginning of the week, and principally on Mondays.

Particulars are given as to the book-keeping, and the interior working of the Society; and they prove a high degree of order, regularity, and circumspection.

The general meeting, of the 25th of June, unanimously voted that the operations of the Society should be extended, as I have already men-tioned, to different branches of insurance, and to a larger circle than before. The board of directors, and a special committee, are entrusted with the execu-tion of this resolution, and the plan to be followed has been just published.

Each branch of insurance forms a separate mutual Society. With reference to the insurance of sick allowance, no important alterations will take place; life assurance will be limited to the single life insurance, pay-able at death; the smallest sum to be insured will be 10 thalers (£1. 10s.), the maximum 3,000 thalers (about £450 sterling).

The plan to insure annuities in case of ill health is quite a new one, at least in Germany, and some of its details will, I think, be of interest. The Society will insure annuities, not exceeding 300 thalers (about £45), and not under 10 thalers (£1. 10s.).

The annuity will begin, in any case, at a certain fixed age of the member (deferred annuity); but it will commence earlier when the mem-ber, either by sickness or accident (but not occasioned *suâ culpâ*), becomes incapable of working (incompetent); the annuity ends with the death of the member, or when the incapability for work ceases.

The insurance may be made under either of two conditions, the annuity falling due—

1. In case of permanent incapability.
2. In case of temporary incapability.

Events and accidents causing the loss of such parts, faculties, or qua-lities of the human body as are necessary to every description of work, are considered as constituting permanent incapability.

Serious illness, for more than a month, is considered as constituting temporary incapability.

If the invalid member is, or becomes, capable of doing some other work than that which he did before he became an invalid, the directors are to fix his annuity according to the difference in the pecuniary values of the two kinds of work. As the data referring to incapability are very scarce, the premiums are to be calculated on a hypothesis of Dr. Heym, published in the *Rundschau of Insurance*, some time ago. According to this hypothesis, the probability of a person aged 79 years becoming invalid or incapable the next year is equal to certainty—that is, equal to 1, while this probability is equal to 0·00002 at the age of 20 years, and a geometrical progression from the age 20 to 79 is formed between these extremes.

The data which Dr. Heym proposes to take, as fundamentals for the Society, are contained in the following table:—

Age.	Persons living.	Sickness of each Person.	Probability of becoming an Invalid next year.	Age.	Persons living.	Sickness of each Person.	Probability of becoming an Invalid next year.
		Days.				Days.	
20	6,415	6·7174	0·00002	58	3,838	14·3582	0·02126
21	6,368	6·5798	0·00003	59	3,716	15·7819	0·02554
22	6,321	6·5483	0·00003	60	3,588	17·1143	0·03068
23	6,274	6·4765	0·00003	61	3,453	18·4646	0·03686
24	6,228	6·4603	0·00004	62	3,315	19·5975	0·04427
25	6,182	6·4540	0·00005	63	3,169	21·0383	0·05318
26	6,134	6·5602	0·00006	64	3,017	21·9169	0·06389
27	6,085	6·7281	0·00007	65	2,858	22·8208	0·07675
28	6,035	6·8341	0·00009	66	2,692	24·1958	0·09219
29	5,985	6·9088	0·00010	67	2,523	25·8923	0·11075
30	5,933	6·9142	0·00013	68	2,351	27·3558	0·13304
31	5,881	6·9648	0·00015	69	2,178	29·9771	0·15981
32	5,826	6·9357	0·00018	70	2,003	33·2040	0·19198
33	5,770	7·1287	0·00022	71	1,829	36·3748	0·23062
34	5,713	7·2394	0·00026	72	1,651	40·2041	0·27703
35	5,655	7·5675	0·00031	73	1,477	43·2733	0·33279
36	5,595	7·6301	0·00038	74	1,308	46·2307	0·39977
37	5,536	7·7378	0·00045	75	1,145	49·4550	3·48022
38	5,476	7·7877	0·00054	76	991	52·6963	0·57687
39	5,415	7·9314	0·00065	77	849	57·0834	0·69298
40	5,354	7·9522	0·00078	78	720	61·4667	0·83245
41	5,292	8·2733	0·00094	79	604	65·0819	1·00000
42	5,229	8·4248	0·00113	80	500	66·7644	
43	5,163	8·5554	0·00136	81	407	73·0500	
44	5,096	8·7333	0·00163	82	330	78·4260	
45	5,025	8·9553	0·00196	83	262	82·2489	
46	4,952	9·0630	0·00235	84	204	86·0696	
47	4,877	9·4276	0·00283	85	155	89·8918	
48	4,801	9·8492	0·00340	86	114	93·7152	
49	4,724	10·3338	0·00408	87	82	97·5371	
50	4,643	10·7021	0·00490	88	57	101·3585	
51	4,560	11·2019	0·00589	89	38	105·1817	
52	4,473	11·6348	0·00708	90	24	109·0034	
53	4,381	11·8386	0·00850	91	15	112·8262	
54	4,283	11·9366	0·01021	92	9	116·6487	
55	4,180	12·3615	0·01227	93	5	120·4703	
56	4,070	12·8136	0·01473	94	3	124·2911	
57	3,956	13·3110	0·01770	95	1	128·1150	

Your obedient servant,

WILHELM LAZARUS.

Hamburg, 16th August, 1859.